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On the superconductivity of graphite interfaces

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Abstract

© 2014, Pleiades Publishing, Inc. We propose an explanation for the appearance of superconductivity at the interfaces of graphite with Bernal stacking order. A network of line defects with flat bands appears at the interfaces between two slightly twisted graphite structures. Due to the flat band the probability to find high temperature superconductivity at these quasi one-dimensional corridors is strongly enhanced. When the network of superconducting lines is dense it becomes effectively two-dimensional. The model provides an explanation for several reports on the observation of superconductivity up to room temperature in different oriented graphite samples, graphite powders as well as graphite-composite samples published in the past.

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